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Connection between scripts embedding motor schemes and decision making: Continuating Jeannerod's motor cognition

Codes are crucial for biological systems since they allow control. They are in fact ubiquitous in biology. Nevertheless, they can arise and be kept in protected conditions. At the start they may have arisen through pure chemical affinity or neural association (Hebbian rule). Once that they are formed, they become fixed and operative through their effectiveness. The biological codes are interfaces between signals (whether external or internal) and functions. In other words, they codify a signal in order to give rise to appropriate functions (or functional actions).

An example is represented by the genetic code, which almost certainly as arisen from a binary code (the first two letters) and with two sub-codes (A-G and C-U). It is interesting to note that there is no code for the selenocysteine (it differs from Cys because at the place of the sulfur atom we have selenium). This shows, that once the code was fixed it could not be changed: in fact the cell makes use of a complicated mechanism through which the stop codon UGA is recoded as an instruction for producing selenocysteine. Another example is represented by our code for color vision. Our visual system uses red (long-wave), green (middle-wave) and blue (short-wave), whose zero is represented by black, but a code magenta, yellow and cyan, whose zero is white, would work equally well. All these codes are linear and can be considered as instances of the Hamming cube.

A good model is bacterial chemotaxis, which, in order to be understood need Markov's blankets. The whole bacterial chemotaxis is an example of information control in which genetic code and sensory code are coupled for producing control on both the environment and internal functions.

The basic structure consisting of codes, signal and functions cannot be changed. Only the relation among these three terms can be altered. Humans impose codes on external signals influencing in this way biological (neural) functions in themselves and others. They do that through the mental codification of operations on physical items with the purpose to make of these a codified system. The mind is a function of (biological-neural) functions and for this reason is able to put signals and functions in a feedback circle.

Focusing now on actions, we can distinguish three levels: Scripts (rational plan), Schematic scenes (programming), and Motor categories (execution). It can be further distinguished a level of more basic motor acts, like prehension, pulling, pushing, ... All categories vectorially expand in scenes while all scenes are organized in scripts. Through this code the mind maps possible operations on signals in an informational space such that the result is itself a combination of external physical units according to a code. In this way the mind can influence both its own and conspecifics' neural excitation patterns (the functions here).